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**E. I. DU PONT DE NEMOURS & COMPANY**  
INCORPORATED

WILMINGTON, DELAWARE 19898

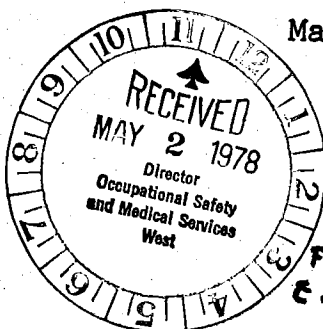
PLASTIC PRODUCTS AND RESINS DEPARTMENT

Manager-Purchasing General

1945 24 MAR 1978

March 20, 1978

Office of the President  
Mc Donnell Douglas Corp.  
P.O. Box 516  
St. Louis, MO 63166



~~McC Gordon~~  
~~McNutt~~  
~~Myrate~~

Dear Sir:

We have updated the Materials and Processing Information, Safety Considerations for "Tedlar"® PVF film. Enclosed is Bulletin TD-33, prepared for your guidance in the safe handling, use, and disposal of "Tedlar"® PVF film. This bulletin supersedes Bulletin No. 3. We encourage a wide circulation throughout your organization, especially to those people handling and marketing the product.

One method we have found for the measurement of gases in a work area is the Drager Multi-Gas Detector. The Drager Kit CH304 and Drager tubes for the measurement of dimethyl acetamide (DMAC) and hydrogen fluoride are available through Guardian Safety Equipment Company, P. O. Box 455, Linden, New Jersey, 07036. The Drager tube used for the analysis of dimethyl acetamide is not selective. In addition to dimethyl acetamide, it also indicates the presence of dimethyl formamide, and basic atmospheric contaminants, such as amines and ammonia. If you believe you may have one or more of these additional contaminants present in your plant atmosphere, it may be necessary to resort to other techniques, such as gas chromatography. This information is offered as a suggestion only.

Please do not hesitate to contact your "Tedlar"® representative, or our Technical Consulting Services group (302/999-3253), if we can be of assistance.

Very truly yours,

*W. W. Ranson*  
W. W. Ranson  
Marketing Manager

cc. J. Skultz 112 D  
G. Doerksen  
J. Spehr

There's a world of things we're doing something about

E. I. DU PONT DE NEMOURS & CO. (INC.)  
PLASTIC PRODUCTS AND RESINS DEPARTMENT  
WILMINGTON, DE 19898

## MATERIALS AND PROCESSING INFORMATION SAFETY CONSIDERATIONS

### General

Laboratory studies by Du Pont and experience by Du Pont and processors have shown that "Tedlar"® PVF film, itself, presents no health hazard.

### Converting or Processing

Residual amounts of Dimethyl Acetamide (DMAC), ranging from 0.05 to 1.0 weight percent, will be present in all "Tedlar"® PVF films. This chemical will be released from the film during processing, particularly at the higher processing temperatures. DMAC is capable of producing systemic injury when inhaled or absorbed through the skin in sufficient quantities over a prolonged period of time.

OSHA Regulations (29 CFR 1910.1000) prescribe that an employee's exposure to DMAC in any 8-hour work shift of a 40-hour work week shall not exceed a time-weighted average of 10 ppm DMAC vapor in air by volume or 35 mg/m<sup>3</sup> liquid in air by weight. Embryotoxicity, which can be produced by giving much higher (near lethal) doses in animals, has not been observed in plant workers. Measurements at several processors' plants have shown the concentrations of DMAC in air to be below 4 ppm. Adequate ventilation must be provided to keep DMAC vapor concentrations within the time-weighted average of 10 ppm prescribed by OSHA.

The film has been processed routinely at temperatures near and above 400°F (204°C), and for short times as high as 450-480°F (232-249°C), using ordinary industrial work area ventilation. At temperatures above 400°F (204°C) or upon prolonged heating, film discoloration and evolution of small amounts of hydrogen fluoride vapor will occur. This is most likely to occur when using the "Tedlar"® as a release film in high temperature curing operations. The time-weighted average concentration of hydrogen fluoride should not exceed 3 ppm vapor in air by volume or 2 mg/m<sup>3</sup> liquid in air by weight, as prescribed by OSHA

Regulations (29 CFR 1910.1000). Vegetation is particularly sensitive to damage by hydrogen fluoride, and attention must be given to the location of exhaust vents or stacks.

Some formulations<sup>(1)</sup> contain, as pigments and additives, small amounts of one or more of the compounds of lead, chromium, cadmium, selenium, arsenic, and antimony. Precautions should be taken not to inhale or swallow particles which might be produced during the processing of these films. Workers should be required to wash thoroughly before eating.

### Finished Products

Either as an exterior or interior finish, "Tedlar"® will not contribute significantly to the danger associated with fire in a residential or industrial structure. The combustion of construction materials and furnishings will typically produce carbon monoxide, as well as an oxygen deficient atmosphere. These constitute a greater potential hazard than the gases generated from "Tedlar"® finished products.

The University of San Francisco<sup>(2)</sup>, in a screening of the relative toxicity of various building materials under fire conditions, found polyvinyl fluoride film ("Tedlar"®) to be significantly less toxic than a large variety of natural materials and other plastics. Materials evaluated include cellular polymers, synthetic polymers, materials used in home furnishings, aircraft seat materials, elastomers, and woods.

Some formulations of "Tedlar"® have been approved for USDA applications, such as wallcovering and ceiling tile in meat and poultry processing plants. "Tedlar"® has not been submitted to or approved by FDA for direct contact with food. Certain types of "Tedlar"® (refer to Converting or Processing Section) should not be used for the above mentioned USDA applications, the surfaces of children's furniture and toys, and other applications where the ingredients of the film may get into the digestive system, either directly or indirectly.

(1) "Tedlar"® 50 (A,B) L20FM, 70BL 20GY, 100BG15WH, 100BL30OG, 150BL30BN, 150BL30CM, 150BL30GO, 150BM30DR, 150BL30CR, 150BL30BB, 150BL30CN, 150BL30DS, 150B(L,G)30GY, 150BL30LG, 150BL30LY, 150BL30GN, 150BS30WH, 200B(M,L)30GY, 200BM30WB, and 200(S,B)S30WH.

(2) Carlos J. Hitiado, "Screening Materials for Relative Toxicity in Fire Situations", *Modern Plastics* (July, 1977).

## Storage

"Tedlar"® does not readily burn or support combustion. Nevertheless, standard fire prevention and control practices should be observed, and large stocks should not be stored with flammable material.

## Waste Disposal

It is preferable to dispose of "Tedlar"® as landfill; if burned, corrosive fumes will be liberated which may injure vegetation and may be harmful to humans.

## NOTE:

*We believe this information is the best currently available on the subject. It is subject to revision as additional knowledge and experience are gained. Du Pont makes no guarantee of results and assumes no obligation or liability whatsoever in connection with the use of this information. This publication is not license to operate under, or intended to suggest infringement of, any existing patents.*

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